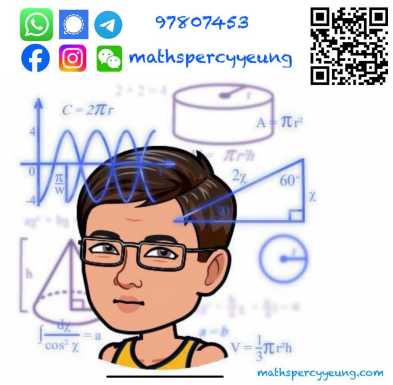



In each of the following, find the distance between the two given points.

**(a)** $A(-8, -2)$ and $B(-4, 0)$

**(b)** $P(2a, -5a)$ and $Q(7a, 7a)$

(Leave your answers in surd form if necessary.)

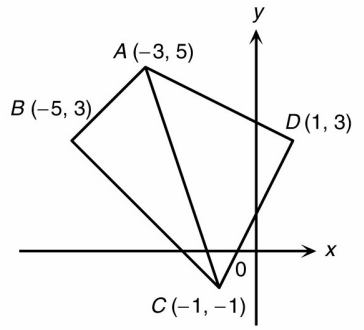
It is given that $P(0, 2)$, $Q(2, 8)$ and $R(8, 6)$ are the vertices of $\triangle PQR$.

**(a)** Is $\triangle PQR$ an isosceles triangles? Explain your answer.

**(b)** Is $\triangle PQR$ a right-angled triangle? Explain your answer.

**(c)** Find $\angle PQR$.

The figure shows a quadrilateral $ABCD$ on a rectangular coordinate plane.




**(a)** Show that $\triangle ABC$ and $\triangle ADC$ are right-angled triangles.

**(b)** Are the perimeters of $\triangle ABC$ and $\triangle ADC$ equal? Explain your answer.

**(c)** Are the areas of $\triangle ABC$ and $\triangle ADC$ equal? Explain your answer.

In each of the following, find the slope of the straight line passing through the two given points on the rectangular coordinate plane.

**(a)** $P(-2, 5)$ and $Q(6, 8)$

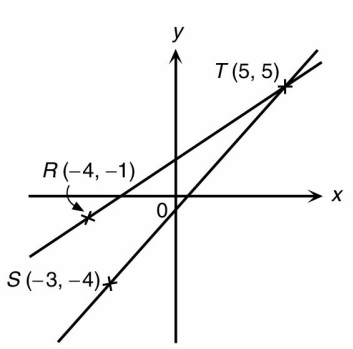
**(b)** $R(5, 0)$ and $S(0, -6)$

In each of the following, find the slope of the straight line passing through the two given points on the rectangular coordinate plane.

**(a)** $T(1, -2)$ and $U(5, -4)$

**(b)** $V(-2, -1)$ and $W(-6, 3)$

In the figure, $R(-4, -1)$, $S(-3, -4)$ and $T(5, 5)$ are three points on the same rectangular coordinate plane.




**(a)** Find the slopes of $RT$ and $ST$.

**(b)** Which line, $RT$ or $ST$, has a greater slope?

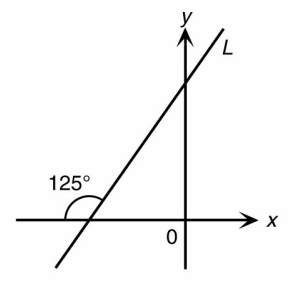
**(c)** Which line, $RT$ or $ST$, is steeper?

Given that the slope of the straight line passing through $R(6, -3)$ and $S(b, 4)$ is $-1$, find the value of $b$.

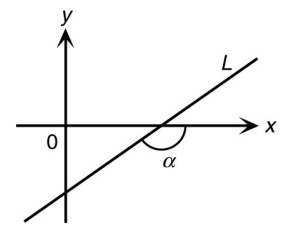
Prove that the three points $P(5, -4)$, $Q(-3, 8)$ and $R(1, 2)$ on the rectangular coordinate plane are collinear.

Given that $A(6, -4)$, $B(-2, 6)$ and $C(1, d)$ are three points on a straight line. Find the value of $d$.

Find the slope of $L$ in the figure correct to 3 significant figures.

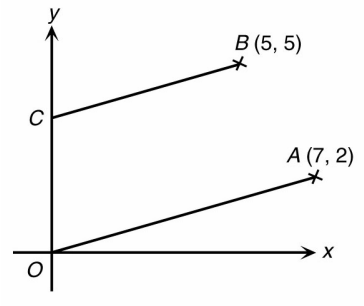



In the figure, the slope of $L$ is $\frac{2}{3}$. Find $\alpha$ correct to 3 significant figures.

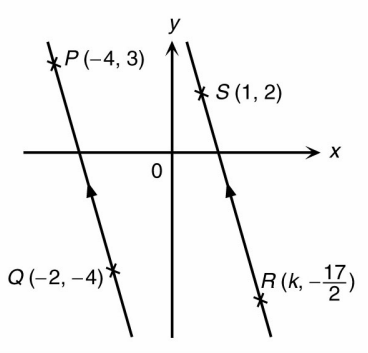



A straight line $L$ passes through $A(2, -1)$ and $B(-6, -8)$. Find the inclination of $L$ correct to 3 significant figures.

Given two points $A(7, 2)$ and $B(5, 5)$. $C$ is a point on the $y$-axis such that $CB$ // $OA$. Find the coordinates of $C$.



In the figure, $P(-4, 3)$, $Q(-2, -4)$, $R\left(k, -\frac{17}{2}\right)$ and $S(1, 2)$ are four points on a rectangular coordinate plane, where $PQ$ // $RS$.

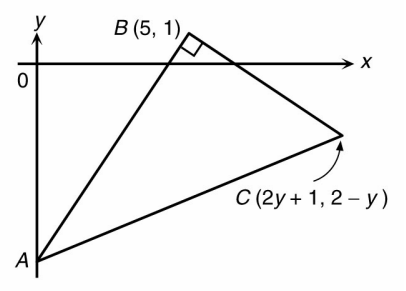



**(a)** Find the value of $k$.

**(b)** Is $PQRS$ a parallelogram? Give your reason.

Given four points $P(-1, t)$, $Q(4, -3)$, $R(0, 1)$ and $S(2t, -3)$. If $PQ \perp RS$, find $t$.

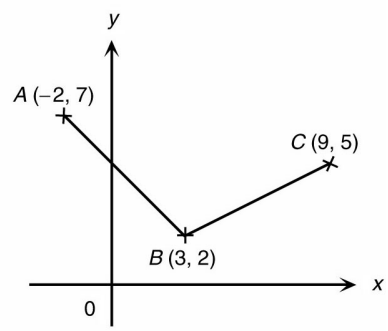
In the figure, $A$ lies on the $y$-axis and $\angle ABC = 90°$. The slope of $AB$ is $\frac{3}{2}$.




**(a)** Find the coordinates of $A$.

**(b)** Find the value of $y$.

In the figure, $A(-2, 7)$, $B(3, 2)$ and $C(9, 5)$ are three points on the same rectangular coordinate plane.

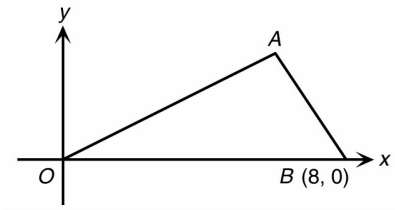



**(a)** Find the slopes of $AB$ and $BC$.

**(b)** Which line, $AB$ or $BC$, has a greater slope?

**(c)** Which line, $AB$ or $BC$, is steeper?

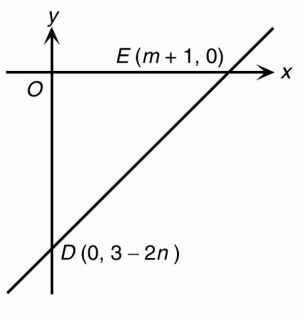
In the figure, $B(8, 0)$ is a vertex of $\triangle OAB$. Slope of $OA = \frac{1}{2}$ and slope of $AB = -\frac{3}{2}$.




**(a)** Find the coordinates of $A$.

**(b)** Hence find the area of $\triangle OAB$.

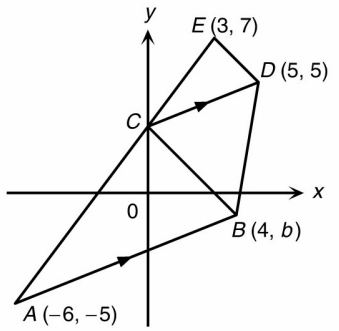
In the figure, the inclination of the straight line $DE$ is 45°.




**(a)** Express $m$ in terms of $n$.

**(b)** If the area of $\triangle DEO$ is 18 sq. units, find the values of $m$ and $n$.

Given four points $A(-6, -5)$, $B(4, b)$, $D(5, 5)$ and $E(3, 7)$. The straight line $AE$ cuts the $y$-axis at $C$ and $CD$ // $AB$.

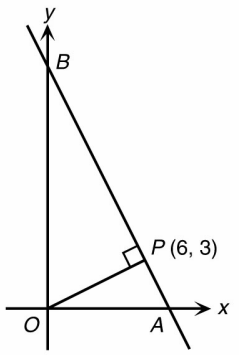



**(a)** Find the coordinates of $C$.

**(b)** Find the value of $b$.

**(c)** Prove that $BC$ // $DE$.

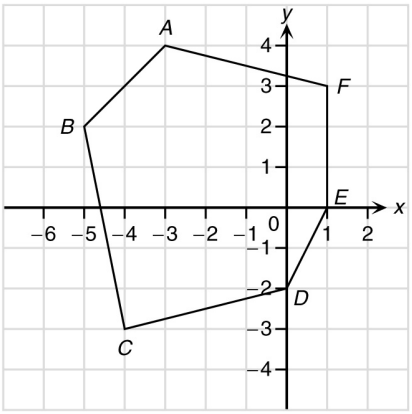
In the figure, $A$ and $B$ are two points on the $x$-axis and $y$-axis respectively. $P(6, 3)$ is a point on $AB$ such that $OP \perp AB$.

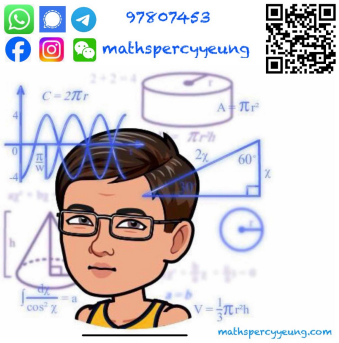



**(a)** Find the coordinates of $A$ and $B$.

**(b)** Hence find the area of $\triangle OAB$.

The figure shows a hexagon *ABCDEF*. Write down the coordinates of all the vertices of the hexagon.



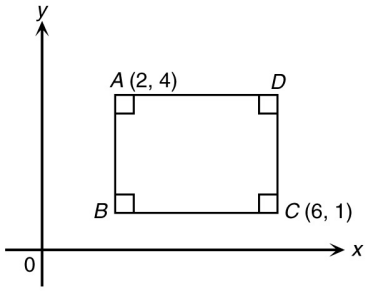




Find the distance between

**(a)** $A(-4, 3)$ and $B(5, 3)$,

**(b)** $P(-1, -1)$ and $Q(-1, -7)$.

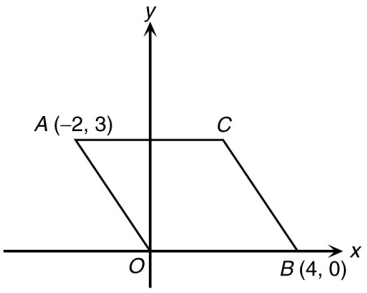
In the figure, $A(2, 4)$ and $C(6, 1)$ are two vertices of rectangle $ABCD$. $AB$ is parallel to the $y$-axis and $BC$ is parallel to the $x$-axis.




**(a)** Write down the coordinates of $B$ and $D$.

**(b)** Find the distance $AB$ and $BC$.

In the figure, $A(-2, 3)$, $O(0, 0)$ and $B(4, 0)$ are three vertices of parallelogram $AOBC$.

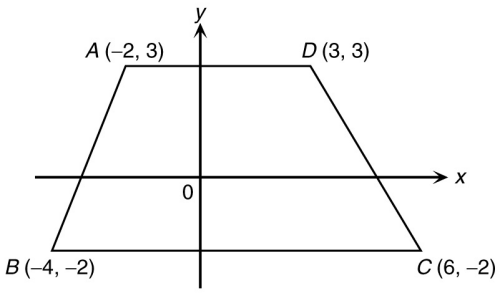



**(a)** Find the coordinates of $C$.

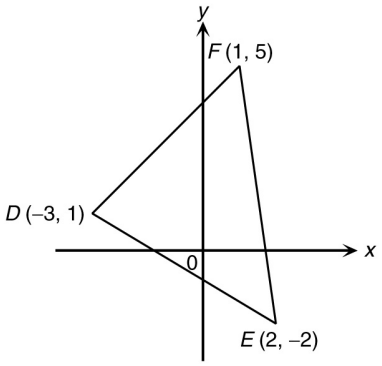
**(b)** Find the area of parallelogram $AOBC$.

Find the areas of the following figures.

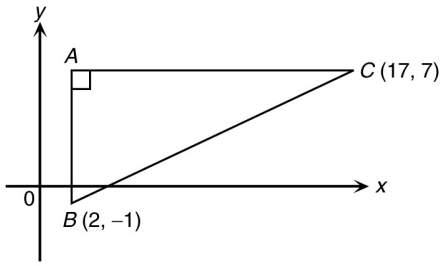
**(a)**




**(b)**



In the figure, $AB$ is parallel to the $y$-axis and $AC$ is parallel to the $x$-axis.

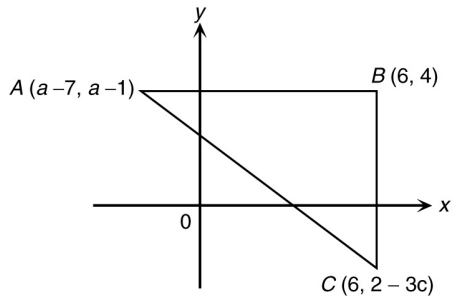



**(a)** Write down the coordinates of $A$.

**(b)** Find $AB$ and $AC$.

**(c)** Find the length of $BC$ by using the Pythagoras' theorem.

In the figure, $A(a-7, a-1)$, $B(6, 4)$ and $C(6, 2-3c)$ are the vertices of $\triangle ABC$. $AB$ is parallel to the $x$-axis.



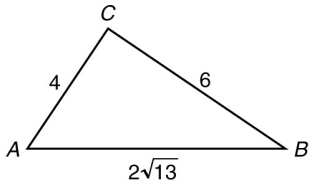

**(a)** Find the value of $a$ and the length of line segment $AB$.

**(b)** If $BC = 6$ units, find the value of $c$.

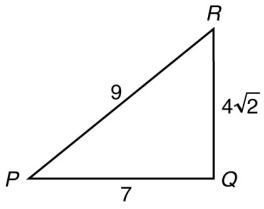
**(c)** Find the length of $AC$ by using the Pythagoras' theorem.

Determine whether each of the following triangles is a right-angled triangle. If it is, state the right angle.

**(a)**

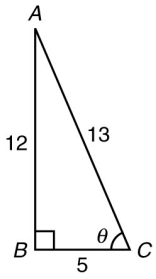



**(b)**

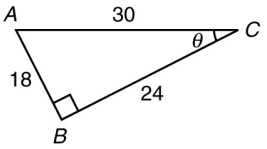



In the following figures, find the values of $\tan\theta$. Give your answers in fractions.

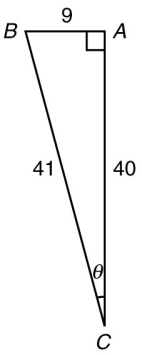
**(a)**




**(b)**

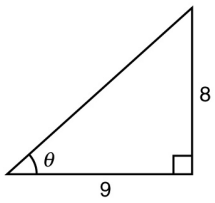



**(c)**

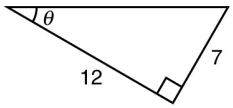


In the following figures, find $\theta$. Give your answers correct to the nearest 0.1° if necessary.

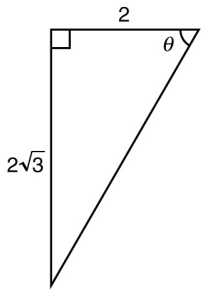
**(a)**

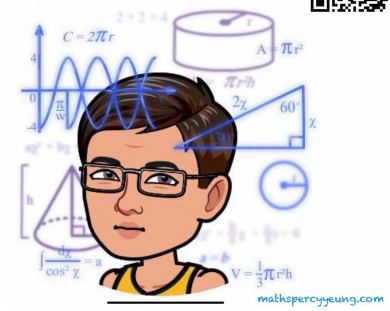



**(b)**




**(c)**






In each of the following, find the distance between the two given points.
(Leave your answers in surd form if necessary.)

**(a)** $P(1, 6)$ and $Q(6, 18)$

**(b)** $R(-3, 4)$ and $S(3, -4)$

**(c)** $T(0, 0)$ and $U(2, -1)$

In each of the following, find the distance between the two given points.

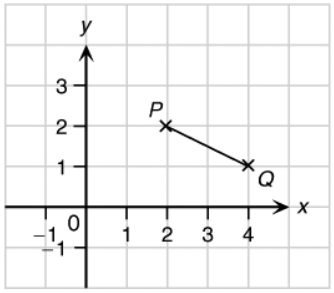
**(a)** $A(1, 1)$ and $B(9, 7)$

**(b)** $C\left(-\frac{9}{2}, \frac{3}{2}\right)$ and $D\left(\frac{3}{2}, 4\right)$

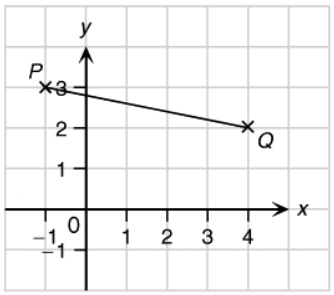
Find the distance between $A\left(\sqrt{5}, \frac{\sqrt{5}}{2}\right)$ and $B\left(\frac{\sqrt{45}}{2}, \frac{\sqrt{45}}{2}\right)$.

In each of the following, find the length of $PQ$.
(Leave your answers in surd form if necessary.)

**(a)**

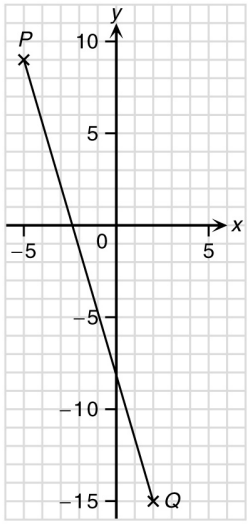



**(b)**

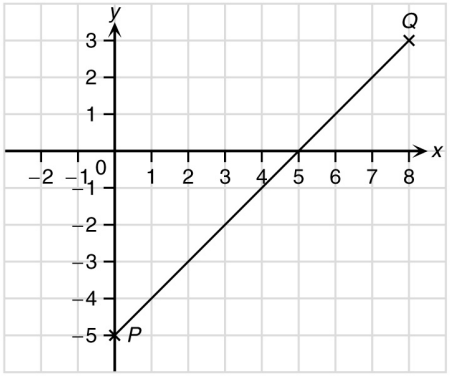



In each of the following, find the length of $PQ$.
(Leave your answers in surd form if necessary.)

**(a)**




**(b)**

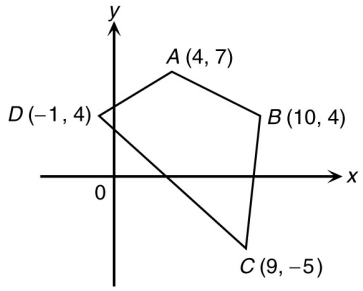


Determine whether the point $C(9, 5)$ is equidistant from $A(1, 7)$ and $B(5, -2)$.

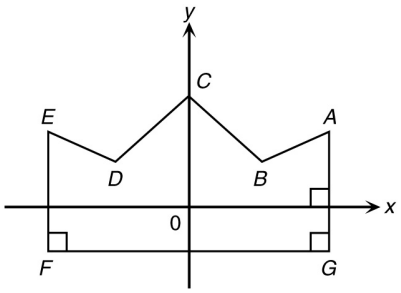
Consider three points $P(-7, 6)$, $Q(2.5, -0.5)$ and $R\left(\frac{1}{2}, \frac{3}{5}\right)$. Which line segment is the longest, $PQ$, $QR$ or $PR$?

It is given that $A(6.1, 2.5)$, $B(0.9, 2)$, $C(-1, -8.2)$ and $D(-0.1, 9.3)$ are the vertices of a quadrilateral. Find the perimeter of quadrilateral $ABCD$. Give your answer correct to 3 significant figures.

It is given that $A(4, 7)$, $B(10, 4)$, $C(9, -5)$ and $D(-1, 4)$ are the vertices of a quadrilateral. Find the difference in lengths of the diagonals.



The figure shows a concave polygon *ABCDEFG*. Determine which line segment(s) satisfy each of the following conditions.




**(a)** The slope is positive.

**(b)** The slope is negative.

**(c)** The slope is zero.

**(d)** The slope is undefined.

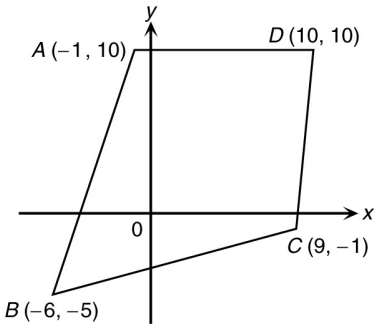
In each of the following, find the slope of the straight line passing through the two given points.

**(a)** $A(0, 3)$ and $B(9, -9)$

**(b)** $P\left(-\frac{\sqrt{5}}{3}, 1\right)$ and $Q\left(\frac{\sqrt{125}}{3}, -5\right)$

(Leaver your answers in surd form if necessary.)

In the figure, $A(-1, 10)$, $B(-6, -5)$, $C(9, -1)$ and $D(10, 10)$ are the vertices of a quadrilateral. Find the slopes of $AB$, $BC$, $CD$ and $AD$.




Given three points, $A(0, -5)$, $B(-1, -3)$ and $C(-2, 1)$ on the same rectangular coordinate plane, determine which line, $AB$ or $AC$ is steeper.

Find the inclination $\theta$ of the straight line $L$ with slope $\frac{4}{5}$. Give your answer correct to 3 significant figures.

The inclination of the straight line $L$ is 70°. Find the slope of $L$ correct to 3 significant figures.

Find the inclination of a straight line passing through $A(-6, 4)$ and $B(4, 8)$. Give your answer correct to 3 significant figures.

Given that the slope of a straight line passing through $A(2, 9)$ and $B(-8, b)$ is 3, find the value of $b$.

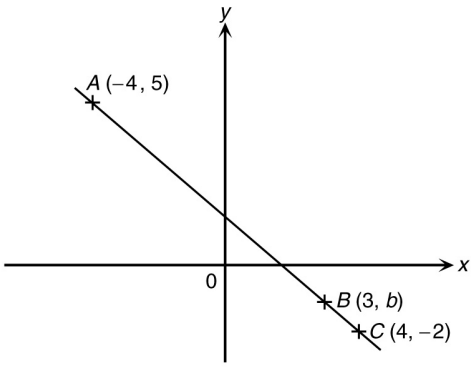
In each of the following, determine whether the given three points are collinear.

**(a)** $A(-4.5, 4)$, $B(-1.6, -0.2)$ and $C(1, -4)$

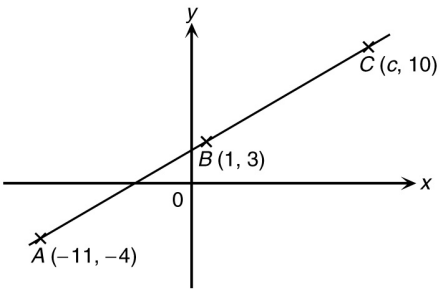
**(b)** $D\left(-12, -\frac{133}{2}\right)$, $E\left(\frac{5}{2}, 6\right)$ and $F\left(1, -\frac{3}{2}\right)$

In each of the following, $A$, $B$ and $C$ are collinear. Find the values of the unknowns.

**(a)**




**(b)**



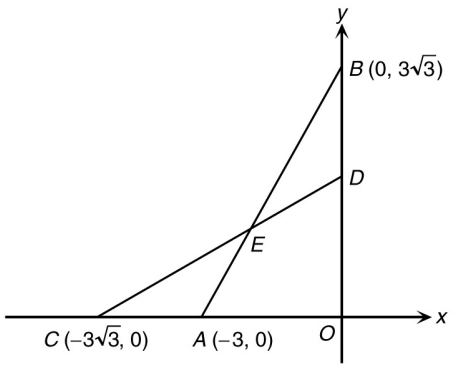

The points $A(4, 11)$, $B(-4, 6)$ and $C(c, -4)$ are collinear. Find the value of $c$.

Given three points $A(-3, 0)$, $B(0, 3\sqrt{3})$ and $C(-3\sqrt{3}, 0)$ on the rectangular coordinate plane, $D$ is a point on the $y$-axis above the $x$-axis such that $CD = AB$. $CD$ cuts $AB$ at $E$.

**(a)** Find $\angle BAO$.

**(b)** Find the coordinates of $D$.

**(c)** Hence, find $\angle CDB$.



The following table shows the slopes of 7 straight lines.

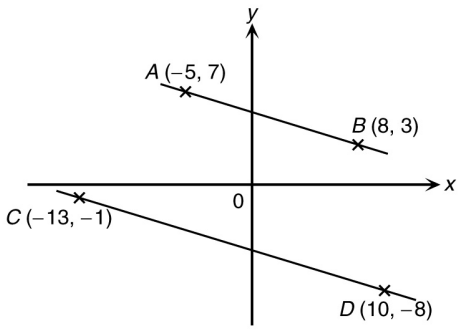
| Straight line | $L_1$ | $L_2$ | $L_3$ | $L_4$ | $L_5$ | $L_6$ | $L_7$ |
|---|---|---|---|---|---|---|---|
| Slope | $\frac{3}{2}$ | 3 | $-\frac{3}{2}$ | 3 | $-\frac{2}{3}$ | $\frac{2}{3}$ | –3 |

**(a)** Write down all pairs of parallel lines.

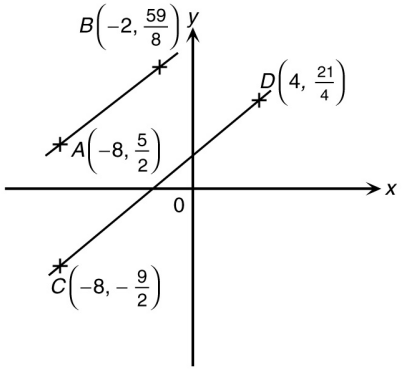
**(b)** Write down all pairs of perpendicular lines.

In each of the following, determine whether the straight lines $AB$ and $CD$ are parallel.

**(a)**

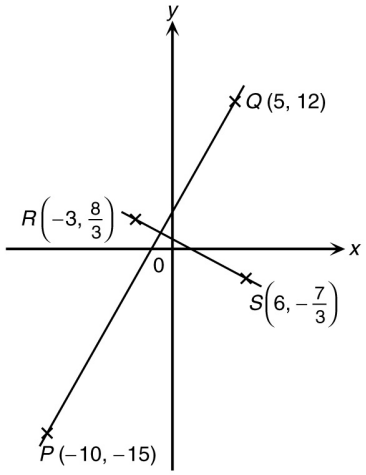



**(b)**

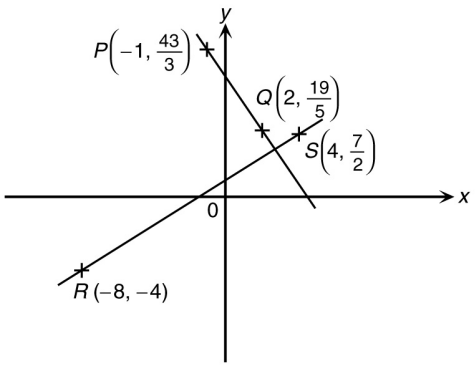


In each of the following, determine whether the straight lines $PQ$ and $RS$ are perpendicular.

**(a)**




**(b)**




For each of the following, find the slopes of $AB$ and $CD$. Hence, determine whether $AB$ and $CD$ are parallel, perpendicular or neither of them.

**(a)** $A(-6, 3)$, $B(0, 6)$, $C(5, 2)$ and $D(1, 0)$

**(b)** $A(2, 2)$, $B(-7, 3)$, $C(-8, -7)$ and $D\left(\frac{1}{9}, 66\right)$

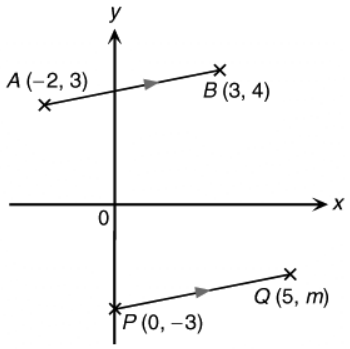
**(c)** $A(6, 11)$, $B(2, -3)$, $C(-3, -6)$ and $D(11, -2)$

$L$ is a straight line passing through $A(3, 0)$ and $B\left(\frac{1}{8}, 2\right)$.

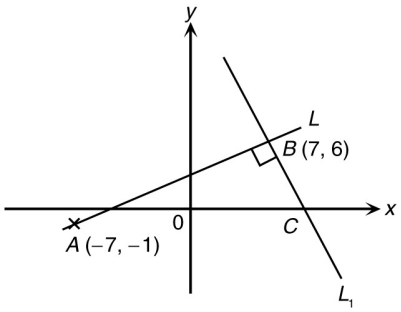
**(a)** If a straight line $L_1$ is parallel to $L$, find the slope of $L_1$.

**(b)** If a straight line $L_2$ is perpendicular to $L$, find the slope of $L_2$.

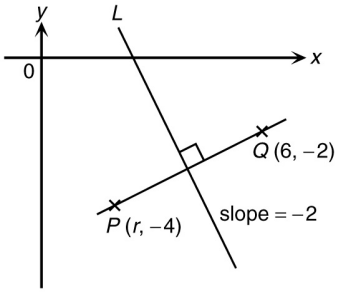
In the figure, $AB$ // $PQ$, find the value of $m$.



In the figure, $L$ is a straight line passing through $A(-7, -1)$. Another straight line $L_1$ intersects $L$ at $B(7, 6)$ and cuts the $x$-axis at $C$. If $L_1 \perp L$, find the coordinates of $C$.




Given that a straight line passes through $P(r, -4)$ and $Q(6, -2)$ and is perpendicular to another straight line $L$ of slope $-2$, find the value of $r$.



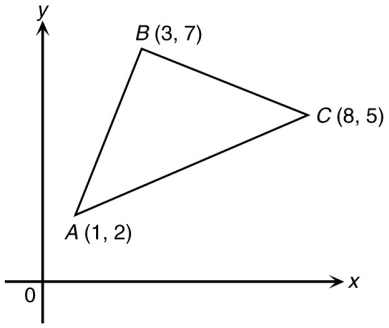
$L_1$ is a straight line passing through $A(7, -7)$ and $B(-1, 6)$. $L_2$ is another straight line passing through $C(0, c)$ and $D(-4, 0)$.

**(a)** If $L_2 \,//\, L_1$, find the value of $c$.

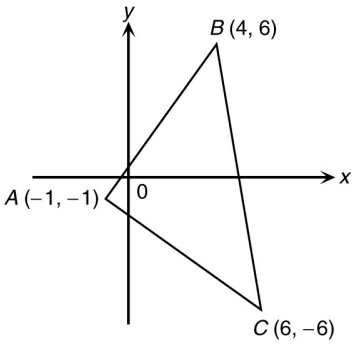
**(b)** If $L_2 \perp L_1$, find the value of $c$.

Determine whether each of the following triangles is right-angled triangle.

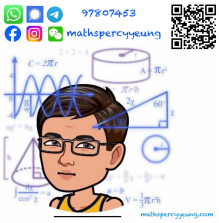
**(a)**




**(b)**



It is given that $a$ is positive, find the distance between the $A(-a, 2a)$ and $B(-3a, 7a)$ in terms of $a$.
(Leave your answer in surd form if necessary.)




The distance between $A(-8, a)$ and $B(-4, 3a)$ is $2\sqrt{13}$ units. If $a$ is a positive number, find the value of $a$.

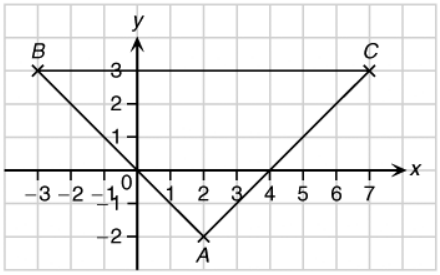
**(a)** Express the distance between $A(2a, 2a)$ and $B(6a, -a)$ in terms of $a$ where $a > 0$.

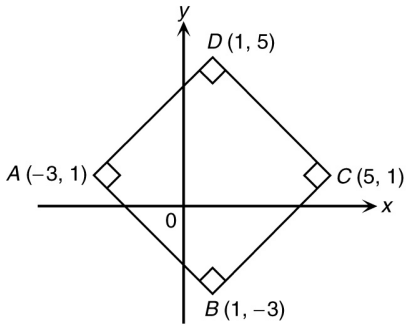
**(b)** If the distance between $A$ and $B$ is 3 times the distance between $C(0, 7)$ and $D(-3, 3)$, find the value of $a$.

It is given that the distance between $A(-1, -2)$ and $B(5, b)$ is 10 units. Find all the possible values of $b$.

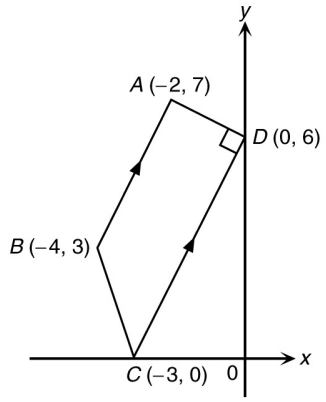
The centre of a circle on the rectangular coordinate plane is $A(0, 4)$. The radius of the circle is 5 units. If $P(k, 1)$ is a point on the circle and $k > 0$, find the value of $k$.

Show that $\triangle ABC$ in the figure is a right-angled isosceles triangle.




In the figures, $A(-3, 1)$, $B(1, -3)$, $C(5, 1)$ and $D(1, 5)$ are the vertices of a quadrilateral. Given that $\angle A = \angle B = \angle C = \angle D = 90°$, prove that $ABCD$ is a square.



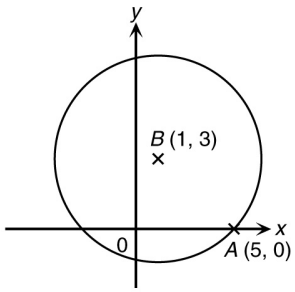

In the figure, $A(-2, 7)$, $B(-4, 3)$, $C(-3, 0)$ and $D(0, 6)$ are the vertices of a trapezium $ABCD$. .If $AB \parallel DC$ and $AD \perp CD$, find

**(a)** $AB$, $CD$ and $AD$,

**(b)** the area of the trapezium.

(Leaver your answers in surd form if necessary.)

The figure shows a circle on the rectangular coordinate plane. It is centered at $B(1, 3)$ and cuts the $x$-axis at $A(5, 0)$.




**(a)** Find the radius of the circle.

**(b)** Determine whether $C(4, 6)$ lies inside or outside the circle on the rectangular coordinate plane.

It is given that the coordinates of $A$ and $B$ are (0, 5) and (6, 5) respectively. $C(x, y)$ is a point above $AB$ such that $\triangle ABC$ is an equilateral triangle. Find the coordinates of $C$.
(Leave your answer in surd form if necessary.)

**(a)** Find the slope of a straight line passing through $A(u, -2u)$ and $B(2, 1 + 4u)$. Express your answer in terms of $u$.

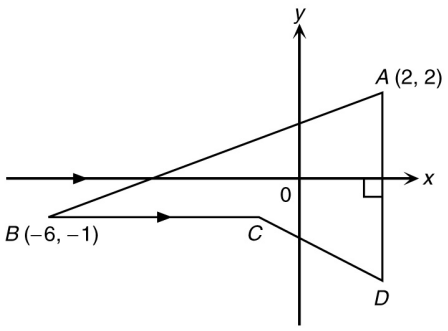
**(b)** What is the value of $u$ if

**(i)** slope of $AB$ is $-\frac{1}{2}$?

**(ii)** $AB$ is vertical?

**(iii)** $AB$ is horizontal?

The figure shows a quadrilateral $ABCD$. $BC$ is parallel to the $x$-axis while $AD$ is perpendicular to the $x$-axis.




**(a)** For each of the following line segments, determine whether its slope is positive, negative, zero or undefined.

**(i)** $BA$

**(ii)** $BC$

**(iii)** $CD$

**(iv)** $AD$

**(b)** If the slopes of $AC$ and $CD$ are 1 and $-\frac{1}{2}$ respectively, find the coordinates of $C$ and $D$.

$L$ is a straight line passing through $P(6, 2)$ and $Q(-18, 9)$.

**(a)** Find the length of $PQ$ and the slope of $L$.

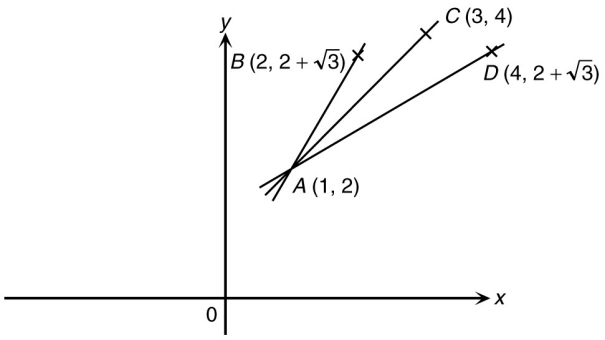
**(b)** If the value of the $y$-coordinate of $Q$ is increased by 10%, find the percentage change in the length of $PQ$ and the slope of $L$. Give your answers correct to 3 significant figures.

$L$ is a straight line passing through $P(1, -3)$ and $Q(8, 4)$.

**(a)** Find the slope and the inclination of $L$.

**(b)** If the value of the slope of $L$ is doubled, find the percentage change in the inclination of $L$. Give your answers correct to 3 significant figures.

In the figure, $A(1, 2)$, $B(2, 2+\sqrt{3})$, $C(3, 4)$ and $D(4, 2+\sqrt{3})$ are 4 points on the rectangular coordinate plane.

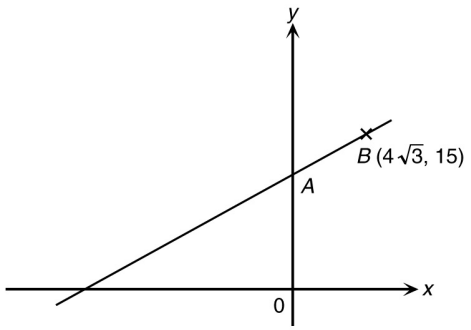



**(a)** Find the inclination of the straight line passing through $AB$.

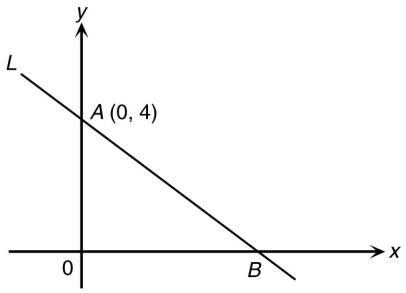
**(b)** Find $\angle BAC$.

**(c)** Show that $AC$ is the angle bisector of $\angle BAD$.

In the figure, a straight line passing through $B(4\sqrt{3}, 15)$ cuts the $y$-axis at $A$. If the slope of the line is $\frac{1}{\sqrt{3}}$, find the coordinates of $A$.

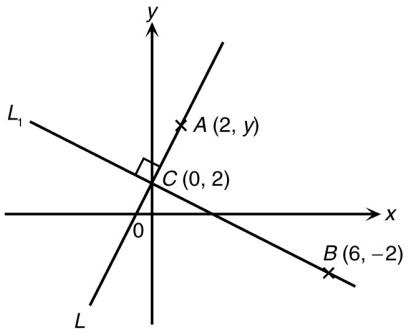



In the figure, a straight line $L$ cuts the $y$-axis and $x$-axis at $A(0, 4)$ and $B$ respectively. If the slope of $L$ is $-\frac{5}{6}$, find the coordinates of $B$.




It is given that the coordinates of $A$ and $C$ are $(-8, -12)$ and $(6, 18)$ respectively. $B$ is a point on the $x$-axis such that the slope of $AB$ is twice that of $BC$. Find the coordinates of $B$.

$L$ is a straight line passing through $A(-2, 3)$ and $B(5, -4)$. If $L$ cuts the $x$-axis and $y$-axis at $P$ and $Q$ respectively, find the coordinates of $P$ and $Q$.




In the figure, $L$ is a straight line passing through $A(2, y)$. $L_1$ is another straight line passing through $B(6, -2)$. $L$ and $L_1$ intersects at $C(0, 2)$. If $L \perp L_1$, find

**(a)** the slope of $L$ in terms of $y$,

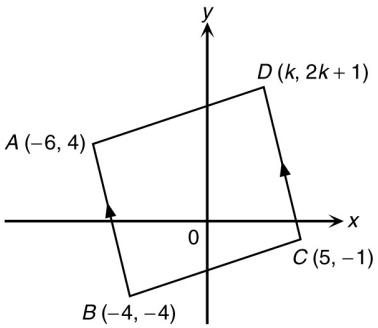
**(b)** the slope of $L_1$,

**(c)** the value of $y$.

$A(8, 2)$, $B(6, 6)$ and $C(0, 3)$ are the vertices of $\triangle ABC$ on the rectangular coordinate plane.

**(a)** Prove that $\triangle ABC$ is a right-angled triangle.

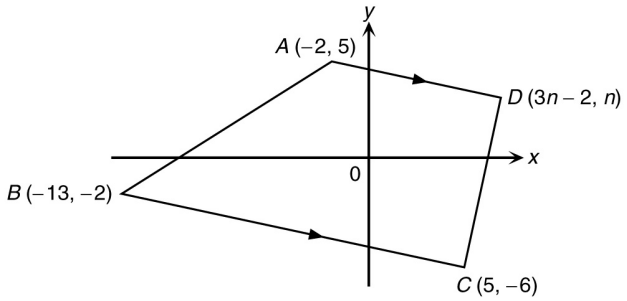
**(b)** Find the area of $\triangle ABC$.




In the figure, $A(-6, 4)$, $B(-4, -4)$, $C(5, -1)$ and $D(k, 2k + 1)$ are the vertices of a quadrilateral $ABCD$.

**(a)** If $AB \parallel CD$, find the coordinates of $D$.

**(b)** Show that $AD \parallel BC$.

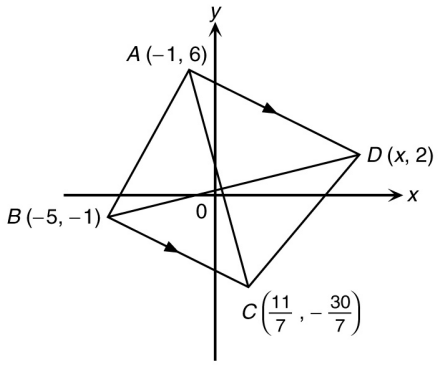



In the figure, $A(-2, 5)$, $B(-13, -2)$, $C(5, -6)$ and $D(3n - 2, n)$ are the vertices of trapezium $ABCD$.

**(a)** If $AD \parallel BC$, find the coordinates of $D$.

**(b)** Show that $DC \perp BC$.

**(c)** Find the area of trapezium $ABCD$.




In the figure, $A(-1, 6)$, $B(-5, -1)$, $C\left(\frac{11}{7}, -\frac{30}{7}\right)$ and $D(x, 2)$ are the vertices of quadrilateral $ABCD$.

**(a)** If $AD$ // $BC$, find the coordinates of $D$.

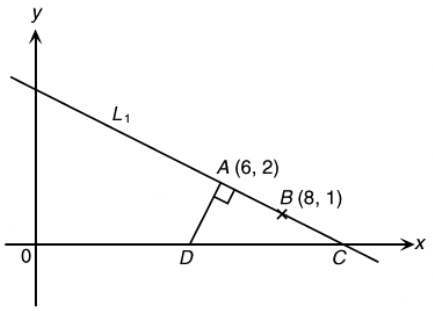
**(b)** Show that the angle between the two diagonals of the quadrilateral is 90°.

$L_1$ is a straight line passing through $P(2, -1)$ and $Q(-1, 2)$. $L_2$ is another straight line passing through $R(1, -2)$ and $S(a, b)$ such that $L_1 // L_2$.

**(a)** Show that $a + b = -1$.

**(b)** If $T(-3, c)$ lies on straight line $L_2$, find the value of $c$.

In the figures, $L_1$ is a straight line passing through $A(6, 2)$ and $B(8, 1)$. It cuts the $x$-axis at $C$.

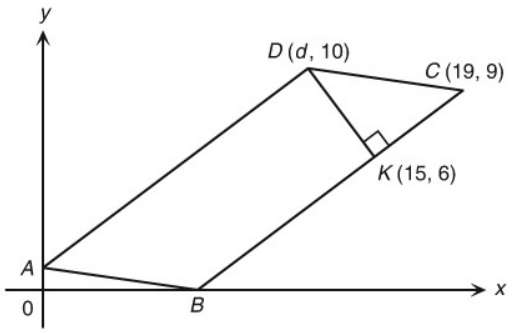



**(a)** Find the slope of $L_1$.

**(b)** Find the coordinates of $C$.

**(c)** $D$ is a point on the $x$-axis so that $AD \perp L_1$. Find the coordinates of $D$.

Referring to the figure, $ABCD$ is a parallelogram. $A$ and $B$ are points on the $y$-axis and the $x$-axis respectively. $K(15, 6)$ is a point on $BC$ such that $DK \perp BC$.

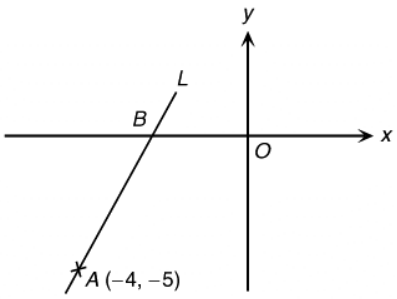


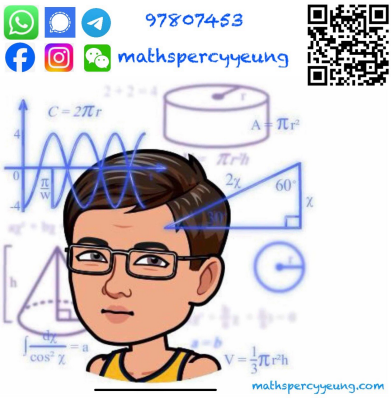

**(a)** Find the value of $d$.

**(b)** Find the coordinates of $A$ and $B$.

**(c)** Find the area of parallelogram $ABCD$.

$L$ is a straight line passing through $A(-4, -5)$ with slope $m$, where $m > \frac{5}{4}$. It cuts the $x$-axis at $B$.




**(a)** Express the distance between $O$ and $B$ in terms of $m$.

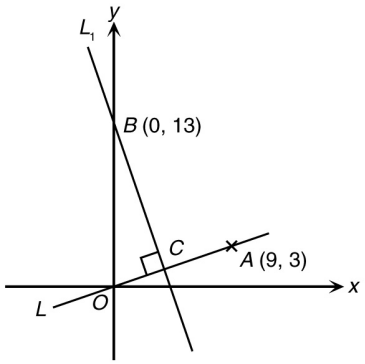
**(b)** If the area of $\triangle OAB$ is 5 sq. units, find the value of $m$.

It is given that the coordinates of $Q$ and $P$ are $(a, a)$ and $(x, 0)$ respectively, where $a, x \neq 0$. If $P$, $O$ and $Q$ are the vertices of an isosceles triangle, find all the possible values of $x$.

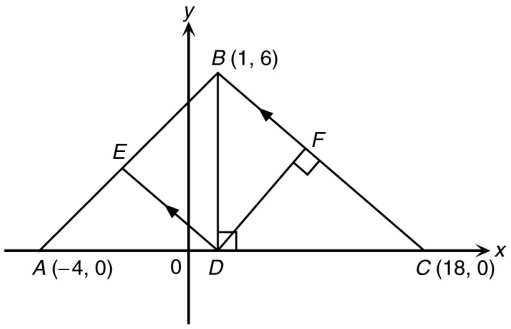
$A(0, 5)$, $B(1, 3)$, $C(2x, 1)$ and $D(4x, 0)$ are the vertices of trapezium $ABCD$ with $AD$ // $BC$.

**(a)** Find the value of $x$.

**(b)** Find the perimeter of trapezium $ABCD$. Give your answer correct to 1 decimal place.




In the figure, $L$ is a straight line passing through $A(9, 3)$ and the origin $O$. Another straight line $L_1$ passing through $B(0, 13)$ intersects $L$ at $C(x, y)$. If $L_1 \perp L$, find the coordinates of $C$.




$A(-4, 0)$, $B(1, 6)$ and $C(8, 0)$ are the vertices of $\triangle ABC$ on the rectangular coordinate plane. $BD$ is the height of $\triangle ABC$.

**(a)** Find the coordinates of $D$.

**(b)** If $F$ is a point on $BC$ such that $DF \perp BC$, find the length of $DF$. Leave your answer in surd form.

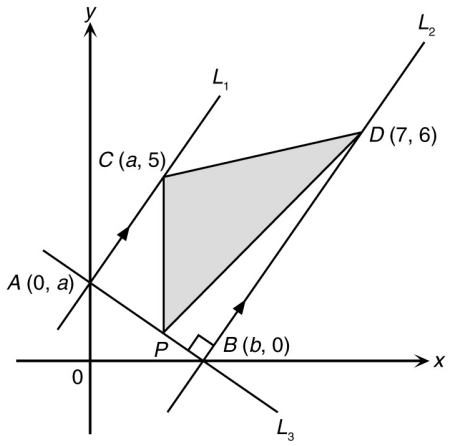
**(c)** If $E$ is a point on $AB$ such that $ED \parallel BC$, find the coordinates of $E$.

It is given that the coordinates of $A$ and $B$ are $(1 - r, 2)$ and $(1 + r, 2)$ respectively, where $r$ is a non-zero constant. $P(x, y)$ is a point on the rectangular coordinate plane such that $AP \perp PB$.

**(a)** Prove that $(x - 1)^2 + (y - 2)^2 = r^2$.

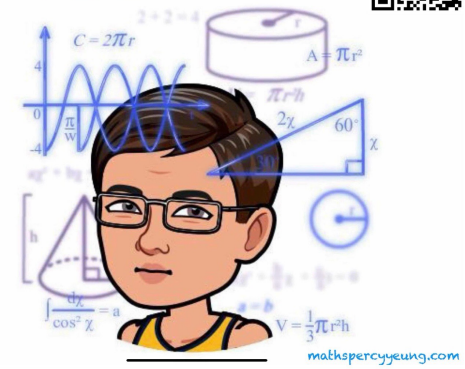
**(b)** If $AP = 2BP$, find all the possible coordinates of $P$ in terms of $r$.

In the figure, $L_1$, $L_2$ and $L_3$ are straight lines, where $L_1 \,//\, L_2$ and $L_2 \perp L_3$. $L_3$ cuts the $y$-axis and $x$-axis at $A(0, a)$ and $B(b, 0)$ respectively, and $OA : OB = 2 : 3$. $C(a, 5)$ and $D(7, 6)$ are points on $L_1$ and $L_2$ respectively.




**(a)** Find the coordinates of $A$, $B$ and $C$.

**(b)** State a point $P$ on $AB$ such that the area of $\triangle CPD$ is the greatest. Hence, find the greatest possible area of the $\triangle CPD$.



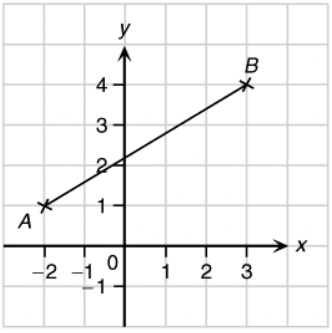

Find the distance between $P(5, 8)$ and $Q(-3, -7)$.

**A.** 2 units **B.** 7 units **C.** 16 units **D.** 17 units

Which of the following points is NOT 13 units form $P(-1, 2)$?

**A.** $A(4, -10)$ **B.** $B(11, 7)$ **C.** $C(-6, 13)$ **D.** $D(-13, -3)$

Find the length of $AB$ in the figure.

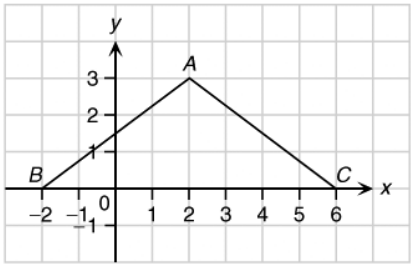



**A.** 4 units **B.** 5 units **C.** $\sqrt{34}$ units **D.** $\sqrt{44}$ units

Express the distance between $P(a, 2a)$ and $Q(-3a, 3a)$ in terms of $a$, where $a$ is positive.

**A.** $\sqrt{5}a$ units **B.** $\sqrt{15}a$ units **C.** $\sqrt{17}a$ units **D.** $\sqrt{19}a$ units

Find the perimeter of $\triangle ABC$ in the figure.

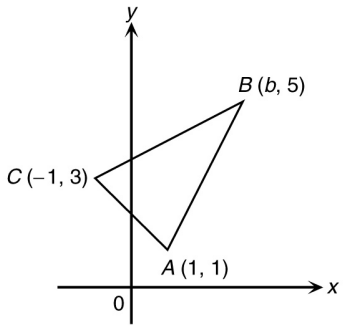



**A.** 18 units **B.** 17 units **C.** 16 units **D.** 15 units

$A(-6, 4)$, $B(15, 4)$ and $C(0, 12)$ are the vertices of $\triangle ABC$. Find the perimeter of $\triangle ABC$.

**A.** 21 units **B.** 24 units **C.** 36 units **D.** 48 units

In the figure, $A(1, 1)$, $B(b, 5)$ and $C(-1, 3)$ are the vertices of an isosceles triangle $ABC$ with $AB = CB$. Find the area of the triangle.

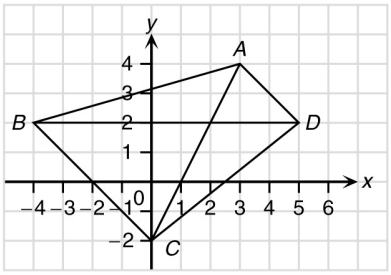



**A.** 4 sq. units **B.** 6 sq. units **C.** 8 sq. units **D.** 10 sq. units

If the distance between $P(k + 1, 2k - 1)$ and $Q(k, k + 2)$ is $k$ units, find the value of $k$.

**A.** $\frac{5}{3}$ **B.** 2 **C.** $\frac{7}{3}$ **D.** $\frac{8}{3}$

Referring to the figure, which of the following statements is/are correct?




**I.** The slope of line segment $BA$ is positive as it slopes upwards from left to right.
**II.** The slope of line segment $CA$ is negative as it slopes downwards from right to left.
**III.** The slope of line segment $BD$ is undefined as it is horizontal.
**A.** I only
**B.** II only
**C.** I and II only
**D.** I, II and III

Find the slope of the straight line passing through $A(9, 19)$ and $B(27, -3)$.

**A.** $-\frac{11}{9}$ **B.** $-\frac{10}{9}$ **C.** $-1$ **D.** $-\frac{8}{9}$

$A(1, 1)$, $B(3, 2)$, $C(3, 4)$, $D(0, 4)$ and $E(0, 2)$ are five points on a rectangular coordinate plane. Which of the following lines is the steepest?

**A.** A straight line passing through $A$ and $B$

**B.** A straight line passing through $A$ and $C$

**C.** A straight line passing through $A$ and $D$

**D.** A straight line passing through $A$ and $E$

The coordinates of $A$ and $B$ are $(a, 2)$ and $(3, 5)$ respectively. If the slopes of $AB$ is twice that of $OA$, where $O$ is the origin, find the value of $a$.

**A.** $\frac{9}{7}$ **B.** $\frac{10}{7}$ **C.** $\frac{11}{7}$ **D.** $\frac{12}{7}$

Which of the following points is collinear with $A(5, 2)$ and $B(4, 1)$?

**A.** $P(0, 1)$ **B.** $Q(5, 0)$ **C.** $R(-4, -1)$ **D.** $S(1, -2)$

$A(4, 2)$, $B(k, 2k + 1)$ and $C(8, -10)$ are three points on a rectangular coordinate plane. Find the value of $k$ so that $A$, $B$ and $C$ are collinear.

**A.** $\frac{11}{5}$ **B.** $\frac{12}{5}$ **C.** $\frac{13}{5}$ **D.** $\frac{14}{5}$

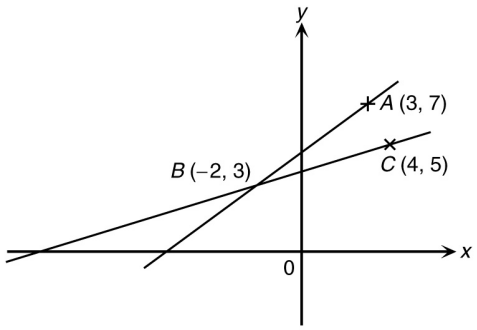
A straight line $L$ passes through $A(-2, 6)$ and $B(12, -2)$. If $L$ cuts the $x$-axis at $C$, find the coordinates of $C$.

**A.** 8.3 **B.** 8.4 **C.** 8.5 **D.** 8.6

A straight line passing through $A(4, 0)$ and $B(3, -3)$ cuts the $y$-axis at $C$. Find the coordinates of $C$.

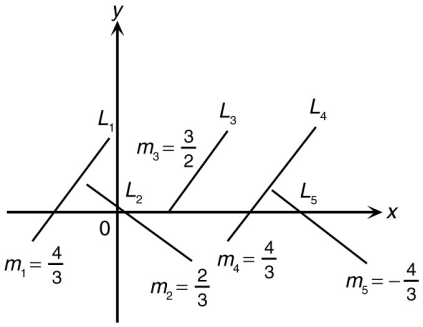
**A.** $(-12, 0)$ **B.** $(-11, 0)$ **C.** $(0, -11)$ **D.** $(0, -12)$

In the figure, a straight line passing through $A(3, 7)$ intersects with another straight line passing through $C(4, 5)$ at $B(-2, 3)$. Find $\angle ABC$ correct to 3 significant figures.




**A.** 20.2°
**B.** 21.2°
**C.** 22.2°
**D.** 23.2°

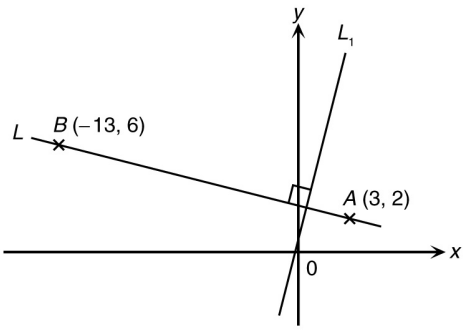
In the figure, $m_1$, $m_2$, $m_3$, $m_4$ and $m_5$ represent the slopes of $L_1$, $L_2$, $L_3$, $L_4$ and $L_5$ respectively. Which of the following must be true?




**I.** $L_1 // L_3$
**II.** $L_2 \perp L_3$
**III.** $L_4 \perp L_5$
**A.** I only
**B.** II only
**C.** I and II only
**D.** I and III only

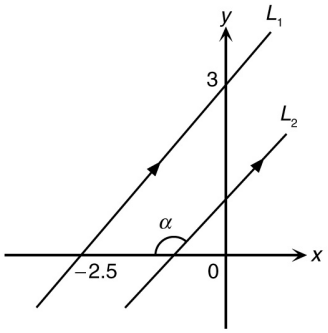
$A(14, 2)$, $B(10, 8)$, $C$ and $D$ are four points on a rectangular coordinate plane such that $AB // CD$. Find the slope of $CD$.

**A.** –1.6 **B.** –1.5 **C.** –1.4 **D.** –1.3




$L$ is a straight line passing through $A(3, 2)$ and $B(-13, 6)$. $L_1$ is another straight line which is perpendicular to $L$. Find the inclination of $L_1$ correct to the nearest 0.1°.

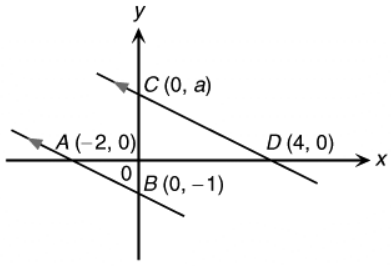
**A.** 75.0° **B.** 76.0° **C.** 77.0° **D.** 78.0°




$L_1$ and $L_2$ are two parallel lines on the rectangular coordinate plane. $L_1$ cuts the $x$-axis and $y$-axis at $(-2.5, 0)$ and $(0, 3)$ respectively. Let $\alpha$ be the obtuse angle between $L_2$ and the $x$-axis, find $\alpha$ correct to 3 significant figures.

**A.** 128° **B.** 130° **C.** 132° **D.** 134°

In the figure, $AB$ // $CD$. Find the value of $a$.




**A.** 4 **B.** 2 **C.** $\frac{1}{2}$ **D.** $\frac{1}{4}$

It is given that the slope of $L_1$ is $\frac{1}{3}$ and $AB \perp L_1$, where the coordinates of $A$ and $B$ are (1, 0) and (0, $n$) respectively. Find the value of $n$.

**A.** 3

**B.** –3

**C.** $\frac{1}{3}$

**D.** $-\frac{1}{3}$

It is given that the coordinates of $A$ and $B$ are (–2, 20) and (–7, 2) respectively. Find the slope of the reflection of $AB$ about the $y$-axis.

**A.** –3.2

**B.** –3.4

**C.** –3.6

**D.** –3.8

It is given that the coordinates of $P$ is (–3, 4). $Q$ is a point on the $y$-axis such that $\angle OPQ = 90°$, where $O$ is the origin. Find the coordinates of $Q$.

**A.** $\left(0, \frac{25}{4}\right)$

**B.** $\left(0, \frac{13}{12}\right)$

**C.** $\left(0, \frac{27}{4}\right)$

**D.** $\left(0, \frac{7}{2}\right)$

$L$ is a straight line perpendicular to another straight line passing through $A(1, 10)$ and $B(–5, –8)$. If $L$ cuts the $x$-axis and $y$-axis at $C(c, 0)$ and $D(0, –4)$ respectively, find the area of $\triangle COD$, where $O$ is the origin.

**A.** 12 sq. units

**B.** 20 sq. units

**C.** 24 sq. units

**D.** 28 sq. units